

WHAT IS CLAIMED IS:

1. A compound of the formula

B¹-L¹-A¹-L²-B²

I

wherein:

5 A¹ is a member selected from the group consisting of alkylene, alkenylene,
6 alkynylene, cycloalkylene, cycloalkenylene, arylene, heteroarylene, heterocycloalkylene,
7 and heterocycloalkenylene, or, alternatively, A¹ represents a single or double bond linking
8 L¹ and L²;

9 L¹ and L² are each independently a member selected from the group
10 consisting of O-, -S-, -N(R¹)-, -C(O)-, -C(O)N(R¹)-, -O-alkylene-, -S-alkylene-, -N(R¹)-
11 alkylene, -C(O)-alkylene, -C(O)N(R¹)-alkylene, -C(O)-O-alkylene, alkylene, alkenylene,
12 alkynylene, cycloalkylene, cycloalkenylene, arylene, heteroarylene, heterocycloalkylene,
13 and heterocycloalkenylene;

4 B¹ and B² are each independently a member selected from the group
5 consisting of alkyl, cycloalkyl, cycloalkenyl, aryl, heteroaryl, heterocycloalkyl, and
6 heterocycloalkenyl;

alternatively, L¹ can be additionally linked to B¹ via a group X¹ to form a 5-9 member ring; and L² can be additionally linked to B² via a group X² to form a 5-9 member ring;

X¹ and X² are each independently a member selected from the group consisting of -O-, -S-, -N(R²)-, -C(O)-, -C(O)N(R²)-, -O-alkylene, -S-alkylene, -N(R²)-alkylene, -C(O)-alkylene, -C(O)N(R²)-alkylene, and -C(O)-O-alkylene; and

23 R¹ and R² are each independently a member selected from the group
24 consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
25 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, aryl(heteroalkyl), (heteroaryl)alkyl, and
26 (heteroaryl)heteroalkyl.

2 A¹ is a member selected from the group consisting of (C₁-C₈)alkylene,
3 arylene, heteroarylene and a single bond;

4 L¹ and L² are each independently a member selected from the group
5 consisting of -C(O)- and -C(O)N(R¹)-;

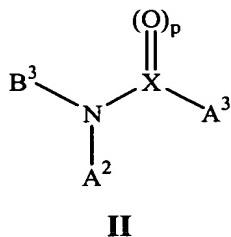
6 R¹ is a member selected from the group consisting of (C₅-C₈)cycloalkyl,
7 aryl, heteroaryl, aryl(C₁-C₄)alkyl, and (heteroaryl)(C₁-C₄)alkyl; and
8 B¹ and B² are each independently a member selected from the group
9 consisting of aryl, heteroaryl, aryl(C₁-C₄)alkyl, (heteroaryl)(C₁-C₄)alkyl, (C₁-C₈)alkyl,
10 and (C₅-C₈)cycloalkyl.

1 3. The compound of claim 1, wherein
2 A¹ is a member selected from the group consisting of (C₁-C₈)alkylene,
3 phenylene, divalent pyridine and a single bond;
4 L¹ and L² are each independently a member selected from the group
5 consisting of -C(O)- and -C(O)N(R¹)-;
6 R¹ is optionally substituted (C₅-C₈)cycloalkyl, optionally substituted
7 phenyl, optionally substituted benzyl, and (C₁-C₈)alkyl; and
8 B¹ and B² are each independently a member selected from the group
9 consisting of optionally substituted (C₅-C₈)cycloalkyl, optionally substituted phenyl, and
10 optionally substituted benzyl.

1 4. The compound of claim 1, wherein
2 A¹ is a member selected from the group consisting of alkylene, arylene,
3 heteroarylene and a single bond;
4 L¹ and L² are each -C(O)N(R¹)-;
5 R¹ is a member selected from the group consisting of aryl, heteroaryl,
6 arylalkyl, and (heteroaryl)alkyl; and
7 B¹ and B² are each independently a member selected from the group
8 consisting of aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, alkyl, and cycloalkyl.

1 5. The compound of claim 1, wherein
2 A¹ is a heteroarylene group containing two fused rings;
3 L¹ and L² are each independently a member selected from the group
4 consisting of -O-, -NH-, and -N(R¹)-;
5 R¹ is a member selected from the group consisting of alkyl and
6 heteroalkyl; and
7 B¹ and B² are each independently a member selected from the group
8 consisting of aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, alkyl, and cycloalkyl.

1 6. A compound of the formula



wherein:

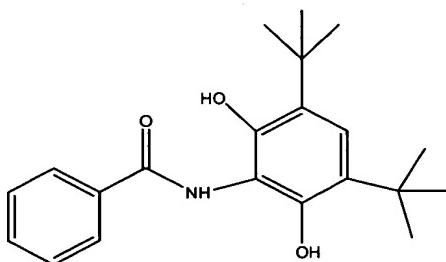
A^2 and A^3 are each independently a member selected from the group consisting of alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and (heteroaryl)heteroalkyl;

B^3 is a member selected from the group consisting of hydrogen, -alkylene- $\text{C}(\text{O})\text{R}^3$, $-\text{C}(\text{O})\text{R}^3$, alkylene- $\text{C}(\text{O})\text{N}(\text{R}^3\text{R}^4)$, $-\text{C}(\text{O})\text{N}(\text{R}^3\text{R}^4)$, alkylene- $\text{S}(\text{O})_n\text{N}(\text{R}^3\text{R}^4)$, $-\text{S}(\text{O})_n\text{N}(\text{R}^3\text{R}^4)$, alkylene- $\text{N}(\text{R}^3\text{R}^4)$, alkylene- OR^3 , and $-\text{C}(\text{O})\text{OR}^3$;

R^3 and R^4 are each independently a member selected from the group consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and (heteroaryl)heteroalkyl;

X is a member selected from the group consisting of C, S, and N; and the subscripts n and p are each independently an integer from 0-2,

provided that the following compound is excluded:



7. The compound of claim 6, wherein

A^2 and A^3 are each independently a member selected from the group consisting of aryl and heteroaryl;

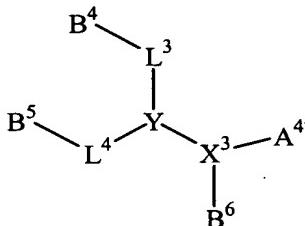
B^3 is a member selected from the group consisting of alkylene- $\text{C}(\text{O})\text{N}(\text{R}^3\text{R}^4)$, and alkylene- $\text{S}(\text{O})_n\text{N}(\text{R}^3\text{R}^4)$;

wherein R^3 is arylalkyl or (heteroaryl)alkyl;

7 R⁴ is hydrogen;
8 X is S; and
9 n is 2.

1 8. The compound of claim 6, wherein
2 A² is an aryl group substituted *ortho* to the nitrogen with a member
3 selected from the group consisting of -OH, -NH₂, -NHC(O)-alkyl, -NHSO₂-alkyl;
4 A³ is a member selected from the group consisting of aryl and heteroaryl;
5 B³ is hydrogen;
6 X is C; and
7 p is 1.

1 9. A compound of the formula:



4 wherein:

5 A⁴ is a member selected from the group consisting of hydrogen, -C(O)R⁵, -
6 C(O)N(R⁵R⁶), -S(O)_nN(R⁵R⁶), -alkylene-N(R⁵R⁶), -alkylene-OR⁵ and -C(O)OR⁵;

7 L³ and L⁴ are each independently a member selected from the group
8 consisting of a single bond, -C(O)-, -S(O)_p-, and alkylene, wherein the subscript p is an
9 integer from 0-2;

10 B⁴, B⁵ and B⁶ are each independently a member selected from the group
11 consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl,
12 fused-benzoheterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl,
13 arylalkyl, aryl(heteroalkyl), (heteroaryl)alkyl, and (heteroaryl)heteroalkyl;

14 alternatively, B⁴ and B⁵ join to form a divalent arylene, heteroarylene,
15 alkylene, or cycloalkylene linkage between L³ and L⁴, and B⁶ is a member selected from
16 the group consisting of hydrogen, alkyl, heteroalkyl, heterocycloalkyl, arylalkyl, or
17 (heteroaryl)alkyl.

18 X³ and Y are each independently a trivalent nitrogen atom or a trivalent or
19 tetravalent carbon atom; and

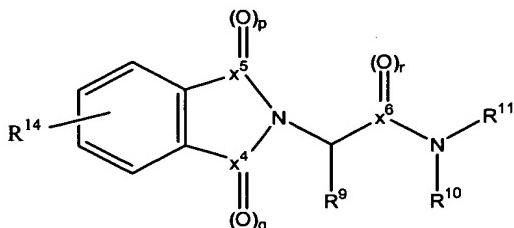
20 R⁵ and R⁶ are each independently a member selected from the group
21 consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
22 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, aryl(heteroalkyl), (heteroaryl)alkyl, and
23 (heteroaryl)heteroalkyl.

1 **10.** The compound of claim 9, wherein
2 A⁴ is a member selected from the group consisting of hydrogen, -
3 C(O)N(R⁵R⁶) and -S(O)₂N(R⁵R⁶);
4 R⁵ and R⁶ are each independently a member selected from the group
5 consisting of alkyl, cycloalkyl, and heterocycloalkyl;
6 L³ and L⁴ are each independently a member selected from the group
7 consisting of -C(O)-, -S(O)₂-, and lower alkylene;
8 B⁴ and B⁵ join to form an arylene or heteroarylene linkage between L³ and
9 L⁴;

10 X is tetravalent carbon in the *R* configuration;
11 Y is trivalent nitrogen; and
12 B⁶ is a member selected from the group consisting of hydrogen, alkyl,
13 heteroalkyl, heterocycloalkyl, arylalkyl, or (heteroaryl)alkyl.

1 **11.** The compound of claim 9, wherein
2 A⁴ is a member selected from the group consisting of hydrogen, -
3 C(O)N(R⁵R⁶) and -S(O)₂N(R⁵R⁶);
4 R⁵ and R⁶ are each independently a member selected from the group
5 consisting of alkyl, cycloalkyl, and heterocycloalkyl;
6 L³ and L⁴ are each independently a member selected from the group
7 consisting of -C(O)-, -S(O)²-, and lower alkylene;
8 B⁴ and B⁵ are each independently a member selected from the group
9 consisting of hydrogen, alkyl, arylalkyl, aryl, and heteroaryl;
10 X is tetravalent carbon in the *R* configuration;
11 Y is trivalent nitrogen; and
12 B⁶ is a member selected from the group consisting of hydrogen, alkyl,
13 heteroalkyl, heterocycloalkyl, arylalkyl, and (heteroaryl)alkyl.

1 **12.** The compound of claim 9, said compound having the formula



2
3
IIIa

4 wherein:

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6 X^4 , X^5 and X^6 are each independently C or S;

7 R^{10} and R^{11} are each independently alkyl, cycloalkyl, or heterocycloalkyl;

8 R^9 is an optionally substituted aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl,

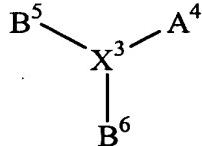
9 heterocycloalkyl;

10 R^{14} is selected from hydrogen, halogen, alkyl, alkoxy, alkylamino,

11 alkylthio, acyl, cycloalkyl and aryl; and

12 the subscripts p, q, and r are each independently integers from 0-2.

1 13. A compound of the formula:



2
3
IIIb

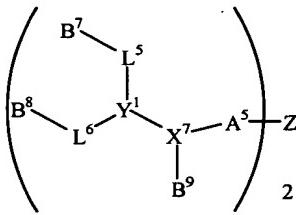
4 wherein:

5 A^4 is a member selected from the group consisting of hydrogen, $-C(O)R^5$,
6 $-C(O)N(R^5R^6)$, $-S(O)_nN(R^5R^6)$, -alkylene- $N(R^5R^6)$, -alkylene- OR^5 and $-C(O)OR^5$;

7 B^5 and B^6 are members independently selected from the group consisting
8 of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, fused-
9 benzoheterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, arylalkyl,
10 aryl(heteroalkyl), (heteroaryl)alkyl and (heteroaryl)heteroalkyl; and

11 X^3 is a trivalent nitrogen atom or a trivalent or tetravalent carbon atom.

1 14. A compound of the formula:



IV

wherein:

A^5 is a member selected from the group consisting of $-C(O)-$, -alkylene-, $-S(O)_n-$, $-C(O)N(R^{12})-$, $-S(O)_2N(R^{12})-$, -alkylene- $N(R^{12})-$, -alkylene-O-, and $-C(O)O-$;

L^5 and L^6 are each independently a member selected from the group consisting of $-C(O)-$, $-S(O)_n-$; and alkylene, wherein the subscript n is an integer from 0-2;

B^7 , B^8 , and B^9 are each independently a member selected from the group consisting of alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, benzoheterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, arylalkyl, aryl(heteroalkyl), (heteroaryl)alkyl, and (heteroaryl)heteroalkyl;

alternatively, B^7 and B^8 join to form a divalent arylene, heteroarylene, alkylene, or cycloalkylene linkage between L^5 and L^6 ;

Z is a member selected from the group consisting of alkylene, heteroalkylene, cycloalkylene, and heterocycloalkylene;

X^7 and Y^1 are each independently a trivalent nitrogen atom or a trivalent or tetravalent carbon atom; and

R^{12} is a member selected from the group consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, arylalkyl, aryl(heteroalkyl), (heteroaryl)alkyl, and (heteroaryl)heteroalkyl.

15. The compound of claim 14, wherein

A^5 is a member selected from the group consisting of $-C(O)-$, $-C(O)N(R^{12})-$ and $-S(O)_2N(R^{12})-$;

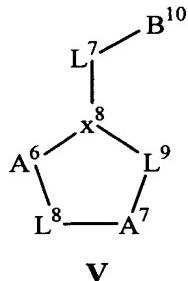
R^{12} is a member selected from the group consisting of alkyl, cycloalkyl, and heterocycloalkyl;

B^7 and B^8 are joined in an arylene or heteroarylene linkage between L^5 and L^6 ;

B^9 is a member selected from the group consisting of alkyl, heteroalkyl, heterocycloalkyl, arylalkyl, and (heteroaryl)alkyl;

10 Z is alkylene, heteroalkylene, or heterocycloalkylene;
11 L⁵ and L⁶ are each independently a member selected from the group
12 consisting of -C(O)-, -S(O)₂-, or lower alkylene;
13 X⁷ is tetravalent carbon; and
14 Y¹ is trivalent nitrogen.

1 **16.** A compound of the formula:



4 wherein:

5 A⁶ and A⁷ are each independently a member selected from the group
6 consisting of arylene, heteroarylene, cycloalkylene, and heterocycloalkylene;
7 B¹⁰ is a member selected from the group consisting of aryl, heteroaryl,
8 arylalkyl, (heteroaryl)alkyl, alkyl, cycloalkyl, cycloalkenyl, heteroalkyl, heterocycloalkyl,
9 and heterocycloalkenyl;

10 L⁷, L⁸, and L⁹ are each independently a member selected from the group
11 consisting of -O-, -S-, -N(R¹³), -C(O)-, -S(O)-, -S(O)₂-, alkylene, -O-alkylene, -S-
12 alkylene, -N(R¹³)-alkylene, -C(O)-alkylene, -C(O)N(R¹³)-alkylene, -C(O)-O-alkylene, a
13 single bond, and a double bond;

14 X⁸ is a member selected from the group consisting of N, and CR¹³; and
15 R¹³ is a member selected from the group consisting of hydrogen, alkyl,
16 heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl, aryl,
17 heteroaryl, arylalkyl, and (heteroaryl)alkyl.

1 **17.** The compound of claim 16, wherein

2 A⁶ and A⁷ are each independently a member selected from the group
3 consisting of aryl, heteroaryl, cycloalkyl, and heterocycloalkyl;

4 B¹⁰ is a member selected from the group consisting of aryl, heteroaryl,
5 arylalkyl, and (heteroaryl)alkyl;

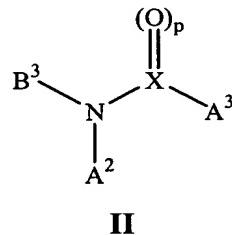
6 L⁷ and L⁸ are each independently a member selected from the group
7 consisting of -C(O)-, -S(O)-, and -S(O)₂-;

8 L⁹ is a member selected from the group consisting of -C(O)-, alkylene, and
9 a single bond; and
10 X⁵ is N.

1 **18.** A pharmaceutical composition, said pharmaceutical composition
2 comprising:
3 a) a compound of claim 1; and
4 b) a pharmaceutically acceptable carrier or excipient.

1 **19.** A pharmaceutical composition, said pharmaceutical composition
2 comprising:

3 a) a compound of the formula



6 wherein:

7 A² and A³ are each independently a member selected from the group
8 consisting of alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
9 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and
10 (heteroaryl)heteroalkyl;

11 B³ is a member selected from the group consisting of hydrogen, -alkylene-
 12 C(O)R³, -C(O)R³, alkylene-C(O)N(R³R⁴), -C(O)N(R³R⁴), alkylene-S(O)_nN(R³R⁴), -
 13 S(O)_nN(R³R⁴), alkylene-N(R³R⁴), alkylene-OR³, and -C(O)OR³;

14 R³ and R⁴ are each independently a member selected from the group
15 consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
16 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and
17 (heteroaryl)heteroalkyl;

18 X is a member selected from the group consisting of C, S, and N; and
19 the subscripts n and p are each independently an integer from 0-2; and
20 b) a pharmaceutically acceptable carrier or excipient.

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1 **20.** A pharmaceutical composition, said pharmaceutical composition
2 comprising:

- 3 a) a compound of claim 9; and
4 b) a pharmaceutically acceptable carrier or excipient.

1 **21.** A pharmaceutical composition, said pharmaceutical composition
2 comprising:

- 3 a) a compound of claim 13; and
4 b) a pharmaceutically acceptable carrier or excipient.

1 **22.** A pharmaceutical composition, said pharmaceutical composition
2 comprising:

- 3 a) a compound of claim 14; and
4 b) a pharmaceutically acceptable carrier or excipient.

1 **23.** A pharmaceutical composition, said pharmaceutical composition
2 comprising:

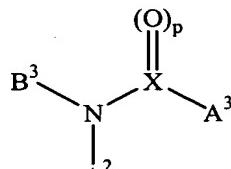
- 3 a) a compound of claim 16; and
4 b) a pharmaceutically acceptable carrier or excipient.

1 **24.** A method for treating a FXR-mediated disease in a mammal, said
2 method comprising:

3 administering a compound of claim 1, thereby treating a FXR-mediated
4 disease in a mammal.

1 **25.** A method for treating a FXR-mediated disease in a mammal, said
2 method comprising:

3 administering a compound of the formula



4 **II**

5
6 wherein:

7 A² and A³ are each independently a member selected from the group
8 consisting of alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
9 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and
10 (heteroaryl)heteroalkyl;

11 B³ is a member selected from the group consisting of hydrogen, -alkylene-
12 C(O)R³, -C(O)R³, alkylene-C(O)N(R³R⁴), -C(O)N(R³R⁴), alkylene-S(O)_nN(R³R⁴), -
13 S(O)_nN(R³R⁴), alkylene-N(R³R⁴), alkylene-OR³, and -C(O)OR³;

14 R³ and R⁴ are each independently a member selected from the group
15 consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
16 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and
17 (heteroaryl)heteroalkyl;

18 X is a member selected from the group consisting of C, S, and N; and
19 the subscripts n and p are each independently an integer from 0-2;
20 thereby treating a FXR-mediated disease in a mammal.

1 **26.** A method for treating a FXR-mediated disease in a mammal, said
2 method comprising:

3 administering a compound of claim 9, thereby treating a FXR-mediated
4 disease in a mammal.

1 **27.** A method for treating a FXR-mediated disease in a mammal, said
2 method comprising:

3 administering a compound of claim 13, thereby treating a FXR-mediated
4 disease in a mammal.

1 **28.** A method for treating a FXR-mediated disease in a mammal, said
2 method comprising:

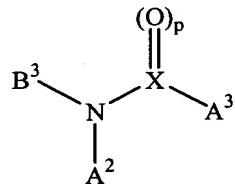
3 administering a compound of claim 14, thereby treating a FXR-mediated
4 disease in a mammal.

1 **29.** A method for treating a FXR-mediated disease in a mammal, said
2 method comprising:

3 administering a compound of claim 16, thereby treating a FXR-mediated
4 disease in a mammal.

1 **30.** A method for modulating *cyp7a* expression levels in a mammal,
2 said method comprising:
3 administering a compound of claim 1, thereby modulating *cyp7a*
4 expression levels in a mammal.

1 **31.** A method for modulating *cyp7a* expression levels in a mammal,
2 said method comprising:
3 administering a compound of the formula



5 **II**

6 wherein:

7 **A**² and **A**³ are each independently a member selected from the group
8 consisting of alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
9 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and
10 (heteroaryl)heteroalkyl;

11 **B**³ is a member selected from the group consisting of hydrogen, -alkylene-
12 C(O)R³, -C(O)R³, alkylene-C(O)N(R³R⁴), -C(O)N(R³R⁴), alkylene-S(O)_nN(R³R⁴), -
13 S(O)_nN(R³R⁴), alkylene-N(R³R⁴), alkylene-OR³, and -C(O)OR³;

14 **R**³ and **R**⁴ are each independently a member selected from the group
15 consisting of hydrogen, alkyl, heteroalkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl,
16 heterocycloalkenyl, aryl, heteroaryl, arylalkyl, (heteroaryl)alkyl, aryl(heteroalkyl), and
17 (heteroaryl)heteroalkyl;

18 **X** is a member selected from the group consisting of C, S, and N; and

19 the subscripts n and p are each independently an integer from 0-2;

20 thereby modulating *cyp7a* expression levels in a mammal.

1 **32.** A method for modulating *cyp7a* expression levels in a mammal,
2 said method comprising:
3 administering a compound of claim 9, thereby modulating *cyp7a*
4 expression levels in a mammal.

1 **33.** A method for modulating *cyp7a* expression levels in a mammal,
2 said method comprising:
3 administering a compound of claim **13**, thereby modulating *cyp7a*
4 expression levels in a mammal.

1 **34.** A method for modulating *cyp7a* expression levels in a mammal,
2 said method comprising:
3 administering a compound of claim **14**, thereby modulating *cyp7a*
4 expression levels in a mammal.

1 **35.** A method for modulating *cyp7a* expression levels in a mammal,
2 said method comprising:
3 administering a compound of claim **16**, thereby modulating *cyp7a*
4 expression levels in a mammal.

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